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WART DISEASE OF POTATOES: THE DEVELOPMENT OF *SYNCHYTRIUM ENDOBIOTICUM* (SCHILB.) PERC., IN "IMMUNE" VARIETIES

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WART DISEASE OF POTATOES: THE DEVELOPMENT OF *SYNCHYTRIUM ENDOBIOTICUM* (SCHILB.) PERC., IN "IMMUNE" VARIETIES

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(With Plate IX.)

A METHOD has been described in an earlier paper(1) whereby the immunity or susceptibility of potatoes to Wart Disease can be tested in the laboratory. Living warts bearing summer sporangia are placed in close contact with the young growing shoots to be tested, and are kept in a wet condition. The shoots of susceptible varieties show signs of infection and develop young warts within a few weeks while no warts are observed on immune varieties.

Subsequently it was noticed that small protuberances and surface irregularities resembling the earliest symptoms of infection sometimes appeared on the shoots of certain varieties that are officially certified as immune. These abnormal growths did not seem to develop further and in no instance produced the characteristic warts observed in susceptible varieties. Microscopic examination showed that infection by the fungus *Synchytrium endobioticum* had taken place. Its development to the stage when the sorus contained a number of summer sporangia was observed in the "immune" varieties Aberdonian, Ben Cruachan, Glenmaid, Katie Glover, Kerr's Pink and White City and in some cases the empty sorus which had apparently liberated the summer sporangia was found. Plate IX shows photographs of the sorus in the varieties mentioned. Further development of the parasite, that is, reinfection by zoospores of summer sporangia and subsequent formation of winter sporangia, has not as yet been detected. Certain "immune" varieties other than those mentioned showed no signs of infection, when tested by this method.

The possibility that the apparent infection of "immune" varieties can be explained by the presence of susceptible rogues does not appear likely because the infected "immunes" differed from susceptible varieties

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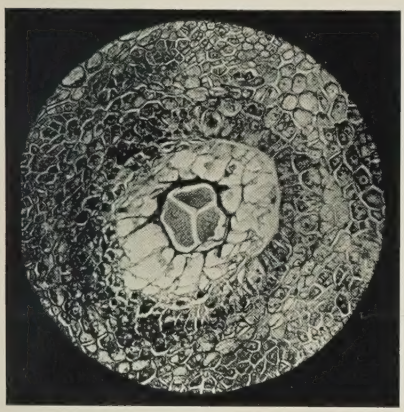

Fig. 1.

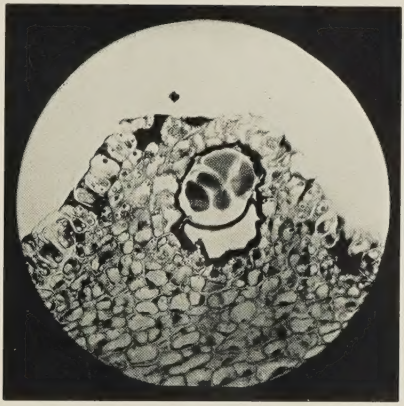

Fig. 2.

Fig. 3.

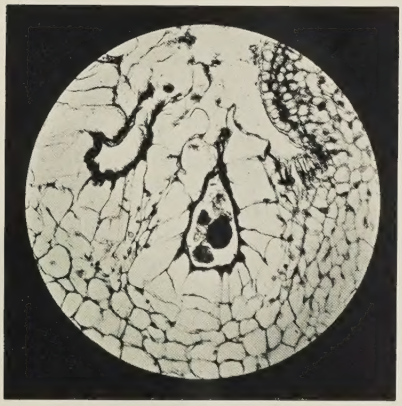

Fig. 4.

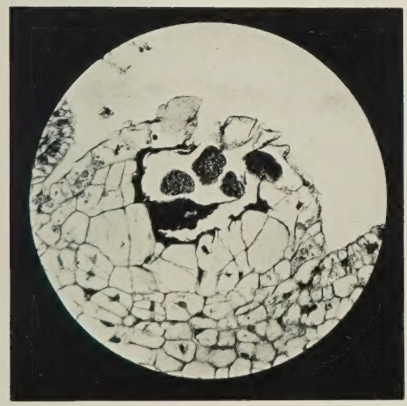

Fig. 5.

Fig. 6.

GLYNNE.—Wart Disease of Potatoes. (358—359.)

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in that the incipient infections never developed into actual warts in the former while in susceptible tubers, warts appeared a week or two after the first signs of infection. Further, the tubers were obtained from reliable sources[1] and five typical specimens of each variety were selected for testing. Infections were found on the shoots of several tubers of Aberdonian, Katie Glover and White City but of only one tuber of the remaining varieties.

These tests are being repeated and immune tubers showing signs of infection will be planted and their variety retested. Work is in progress to determine (*a*) which immune varieties are attacked, (*b*) whether winter sporangia are produced, and if not, (*c*) the causes which check the development of the parasite.

[1] Aberdonian, Ben Cruachan, Glenmaid, White City were obtained from Mr H. Bryan, Potato Testing Station, Lathom, Ormskirk, and Kerr's Pink from Mr A. W. McAlister, Dumfries, Scotland, and Katie Glover from Messrs Dobbie and Co., Edinburgh.

EXPLANATION OF PLATE IX.

Fig. 1. Katie Glover. A sorus showing three sporangia. The section is transverse to the host cell. There is some plasmolysis. Stained safranin. Panchromatic plate. Green filter. × 150.

Fig. 2. White City. A sorus showing five sporangia in the sorus and the empty prosoral membrane below. The section is longitudinal to the host cell. Stained Flemming's triple. Panchromatic plate. Green filter. × 150.

Fig. 3. Kerr s Pink. A sorus showing five sporangia. The section is probably oblique to the host cell. Stained Flemming's triple. Ortho process plate. × 150.

Fig. 4. Ben Cruachan. A sorus containing summer sporangia and an empty sorus. The section is longitudinal to the host cell. Stained iron-alum haematoxylin and orange G. Ortho process plate. × 150.

Fig. 5. Aberdonian. A sorus, either broken or about to liberate four summer sporangia. Part of the empty prosoral membrane is seen below the sorus. The section is longitudinal to the host cell. Stained iron-alum haematoxylin. Ortho process plate. × 150.

Fig. 6. Glenmaid. Empty sorus after liberating summer sporangia. The section is longitudinal to the host cell. Stained iron-alum haematoxylin. Ortho process plate. × 150.

REFERENCES.

(1) GLYNNE, MARY D. (1925). Infection Experiments with Wart Disease of Potatoes *Synchytrium endobioticum* (Schilb.) Perc. *Ann. App. Biol.* XII, 1, 34–60.

(2) GLYNNE, MARY D. (1926). The Viability of the Winter Sporangium of *Synchytrium endobioticum* (Schilb.) Perc., the Organism causing Wart Disease in Potato. *Ann. App. Biol.* XIII, 19–36.

ERRATUM.

In Reference (2), Table IV, p. 26. The sentence "Stain in 2·5 % methylene blue aq." *should read* "Stain in 0·25 % methylene blue aq."

(*Received May* 11*th*, 1926.)

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